



America wants a big car

In light of EPA's demanding mileage requirements for 1985, the future of the full-sized car was questionable—until now. A technological breakthrough from Exxon Enterprises Inc. (EEI) makes the theoretical advantages of the hybrid car a full-sized reality.

This new technology from EEI is not in developmental stages; it is ready now. The prototype has been engineered, tested, driven, proven.

This proven prototype makes all the promise of the theoretical full-sized hybrid a driving reality. The most power-hungry driving conditions are taken in stride. Yet, at 27 mpg, fuel economy is 50 to 100 percent better than conventional vehicles.

That means federal fuel economy standards for 1985—and beyond—can be met if production planning begins now.

And tooling up for production can cost billions of dollars less than would have been the case with alternative designs. EEI's proven hybrid powerpack could easily and relatively quickly be adapted to any full-sized (4000+ lbs.) sedan, van or pickup coming off production lines today. (For our prototype, we have used a 1975 Chrysler Cordoba with all options.) We may have revolutionized the powerpack, but not the whole car.

And that, after all, was the purpose of our technological thrust—to *keep* the full-sized car with unlimited range and full options, the car that has always been America's traditional preference.

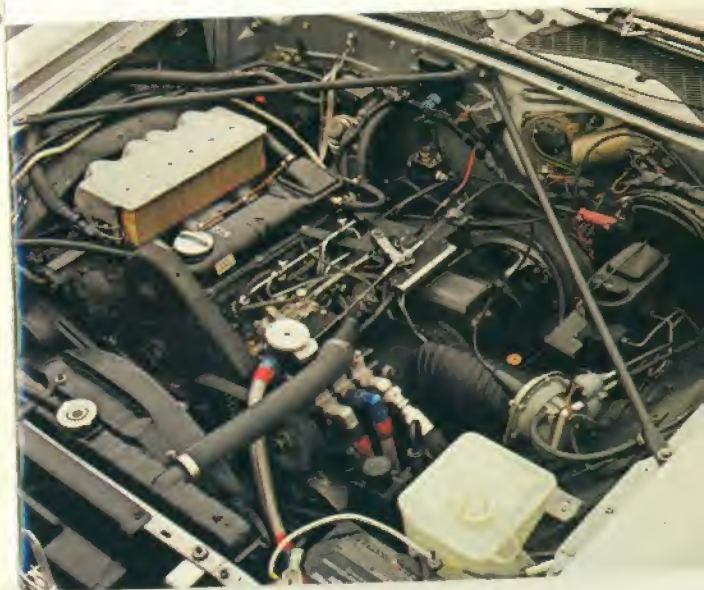
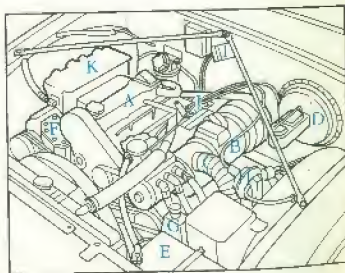
For a look under the hood of our prototype, lift the small page to the immediate left. You'll see the diesel/electric hybrid powerpack that delivers performance *and* mileage.

The key element is the Electrocharger™ from EEI, which is the first dc-to-ac inverter of its kind.

with a small energy appetite.

The drivetrain meets average power demands with the small diesel; meets peak power demands with the battery-powered ac motor. The battery, recharged when there is excess power available from the diesel, dissipates little energy because it is used only during periods of peak power demand. This demand corresponds to the top of the power peaks to be met during acceleration and hill climbing.

- A. DIESEL ENGINE
- B. AC MOTOR
- C. COOLING DUCT (AC MOTOR)
- D. BRAKE BOOSTER
- E. SLI BATTERY
- F. AIR-CONDITIONING COMPRESSOR
- G. POWER-STEERING PUMP
- H. CRUISE CONTROL
- I. GLOW PLUG RELAY
- J. THROTTLE LINKAGE
- K. AIR CLEANER

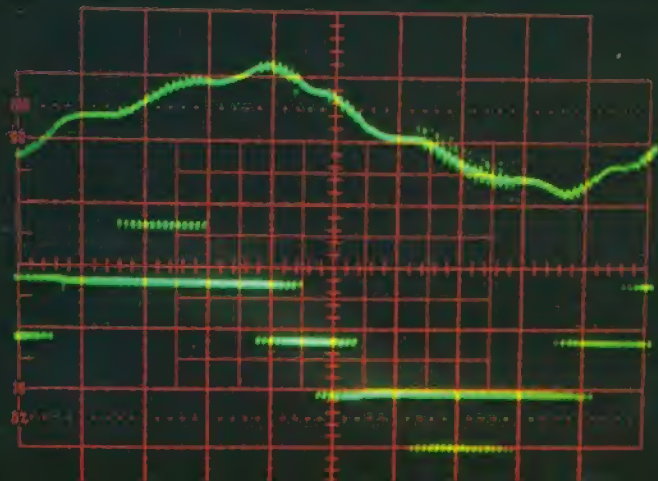




The EEI Electrocharger™ converts dc to ac



You're looking at the breakthrough. This CRT scan shows you how the Electrocharger™ from EEI creates a smooth, nearly perfect current sine wave (top) from a stepped dc voltage source (bottom). No one else has been able to design a small, economical inverter that delivers an ac sine wave this perfect at such a high power rating. And the EEI Electrocharger delivers efficiencies



The Electrocharger, smaller, less expensive and far more efficient than any other inverter to date, eliminates a basic problem which has plagued hybrids from the very beginning.

The unique combination of small size, low cost and high efficiency makes EEI's solid state Electrocharger a major automotive breakthrough.

It wasn't developed overnight; work began over three years ago. The challenge was a big one; we wanted to develop what had always been, quite literally, a missing link in hybrid powertrains.

What had been missing for hybrids that needed an electric motor was this: an inverter both small and efficient enough to make it possible to utilize a small ac motor, which could provide much higher efficiency at lower cost than any dc motor.

That link is missing no longer, now that the EEI Electrocharger is here.

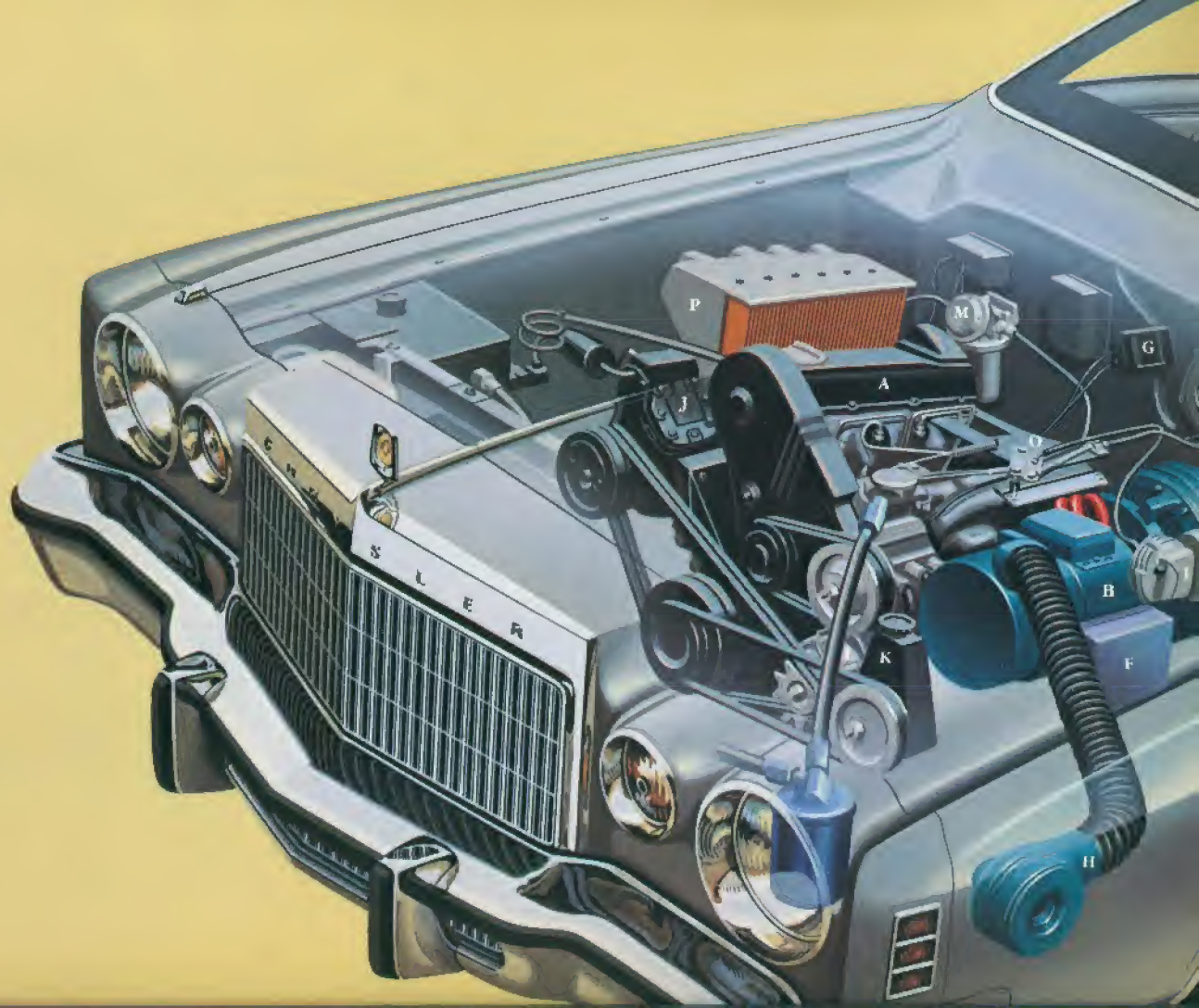
The reason it works so well is because it's the first inverter capable of converting a dc source into an almost perfect ac sine wave. The ac motor, fooled into thinking it sees the kind of smooth waveform that makes it work best, behaves accordingly — delivering up to 100 kW of peak power as required. (An output scan is shown under the small page.)

Since the Electrocharger makes it possible to fully utilize the power potential of an ac motor, it is then possible to use a small heat engine (in the case of our prototype, a 4 cylinder, 50 hp, VW diesel).

The effect is far greater tandem efficiency between the synchronized power outputs of both the engine and the motor.

The result is the first truly practical hybrid car in automotive history.

with unequaled efficiency of 95+ %.





- A. DIESEL ENGINE — 4 CYLINDER, 50 HP
- B. AC MOTOR — 3 PHASE, 100 HP
- C. MIXER-BOX TRANSMISSION
- D. ELECTROCHARGER™
- E. ELECTRIC POWER SYSTEM BATTERIES — 10 SLI (STARTING, LIGHTS, IGNITION) BATTERIES
- F. ELECTRONIC COMPONENTS
- G. GLOW PLUG RELAY
- H. COOLING BLOWERS
- I. CRUISE CONTROL
- J. AIR-CONDITIONING COMPRESSOR
- K. POWER STEERING PUMP
- L. STANDARD CHRYSLER ALTERNATOR
- M. DIESEL FUEL FILTER
- N. POWER-BRAKE BOOSTER
- O. THROTTLE LINKAGE
- P. AIR CLEANER



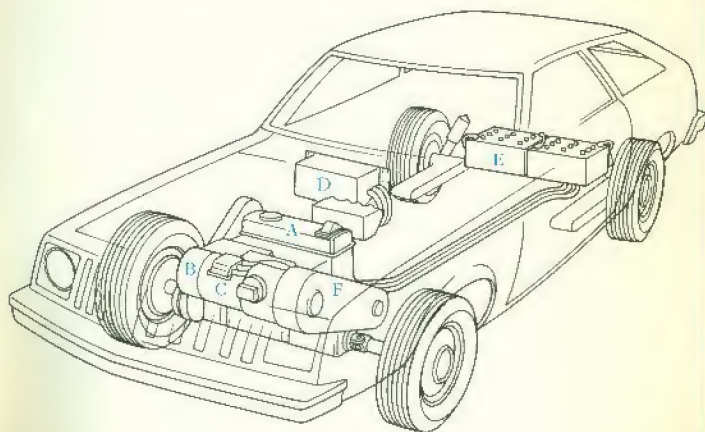
Why the Electrocharged™ hybrid is



- A. 4 CYLINDER DIESEL
- B. COOLING SHROUD
- C. AC MOTOR
- D. ELECTROCHARGER™
- E. BATTERIES
- F. MIXER-BOX TRANSMISSION

Here is an alternative configuration: front engine with front-wheel drive. Whatever configuration is selected, the car can be produced at relatively low cost because Electrocharger technology makes it possible to use a small, efficient 4 cylinder diesel along with a low cost ac electric motor. Everything, with the exception of the Electrocharger, is existing hardware.

FRONT WHEEL DRIVE CONFIGURATION



Exhaustive testing proves that this diesel/electric hybrid is the most realistic contender for the short term—and can take Detroit a long way toward long-term solutions.

The *theoretical* advantages of the full-sized hybrid vehicle have long been recognized by automotive authorities. There was no doubt that a car powered by efficiently synchronized multiple power sources could offer much greater fuel economy for full-sized cars.

But that was theory only—until the advent of EEL Electrocharger technology. It makes a reality of the best possible hybrid combination, a diesel engine and an ac electric motor.

The Electrocharged hybrid's advantages are worth repeating: 1) 27 mpg, 2) meets federal fuel economy standards beyond 1985, 3) performance independent of driving time, 4) efficient pollution control and 5) use of two very efficient power sources, a small diesel engine and a lightweight ac electric motor—all in a full-sized car with luxury options and unlimited range.

But the advantages of the Electrocharger itself go far beyond our hybrid, because Electrocharger technology is completely compatible with virtually all of the most advanced engine designs now on the drawing boards—including the Stirling.

This compatibility is of critical importance to Detroit. It means that producing the Electrocharged hybrid now is an investment in future hybrids that will use advanced engines.

Considering both technology and production, the Electrocharger could keep Detroit profitably in the lead for a long time to come.

We have no doubts that the Electrocharged diesel/electric hybrid is the way to go now; and Electrocharger technology is the way the future will go.

he car to go with now.



Drive into the future with the kind of car



The Electrocharger™ from EEL.

It can help keep Detroit's future
as big as its best years.

EXON Enterprises Inc.
P.O. Box 192
Florham Park, N.J. 07932

Design: Barbara Casado. Printed in U.S.A.
Copyright: Exxon Enterprises Inc. November 1978

Detroit, your future
can be both as big and as small
as America wants it.